



## **NASA STTR 2009 Phase I Solicitation**

### **T10.02 Energy Conservation and Sustainability**

**Lead Center: SSC**

John C Stennis Space Center (SSC) is a large rocket propulsion test facility located in southern Mississippi close to the Louisiana state line. Due to the size of the test facilities, energy consumption is very large. In an effort to conserve on energy, there is an interest in pursuing innovation in the following areas:

#### **Innovative Geothermal Technology**

SSC is interested in innovative geothermal technology in an effort to reduce energy consumption, reducing the Center's carbon footprint. The feasibility and application of geothermal technology has not been investigated for use at SSC. SSC is looking for geothermal technology that is cost effective to implement and maintain. There are potential commercial and residential applications. The feasibility of geothermal technology will require an assessment of the local topography, underground soil composition, location of water "sinks", and determination of the area's ground "constant" temperature. Concepts will be evaluated based on their potential efficiency, ease of implementation and maintenance, and flexibility of applications (including, but not limited to, HVAC, preheating hot water heaters, and other means of extracting energy). Proposals will also be evaluated based on the maturity level to which the technology will be developed and innovative techniques.

#### **Innovative Lighting Technology**

Stennis Space Center is interested in developing innovative technologies, systems, or methodologies that will reduce the energy consumption and heat generation from facility lighting while maintaining the desired level of illumination for safety and effective work environments. SSC is interested in innovative lighting technologies for the test area and parking lots. These lighting technologies will need to reduce energy consumption while maintaining a comfortable and safe working environment. SSC is particularly interested in replacing costly lighting in the test area (test stands, hydrogen/oxygen environments, hazardous and potentially corrosive environments). The lighting should be in compliance with IESNA RP 7-01, Practice for Industrial Lighting. Proposals will be evaluated based on the maturity level to which the technology will be developed and innovative techniques that will provide a reasonable life expectancy. Proposals will also be evaluated on implementation strategy and ease of maintenance.

#### **Assessment of Best Practices to Determine Test Programs Carbon Footprint and Environmental Impact**

SSC is interested in technologies, systems, or methodologies for measuring and analyzing the carbon footprints of rocket engine testing activities. Due to the variety of rocket engine propulsion systems testing and the nature of the facilities required for testing, it would be useful to have ways to measure and understanding the carbon footprint

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generated by these test activities to effectively control and mitigate them as much as possible. A relatively generic methodology that can be suited for different test programs is desirable. Proposals will be evaluated based on the feasibility and applicability of Life Cycle Assessment on test programs or other applicable carbon assessment tools. Tools developed should be in compliance with ISO 14044 and ISO 14040.